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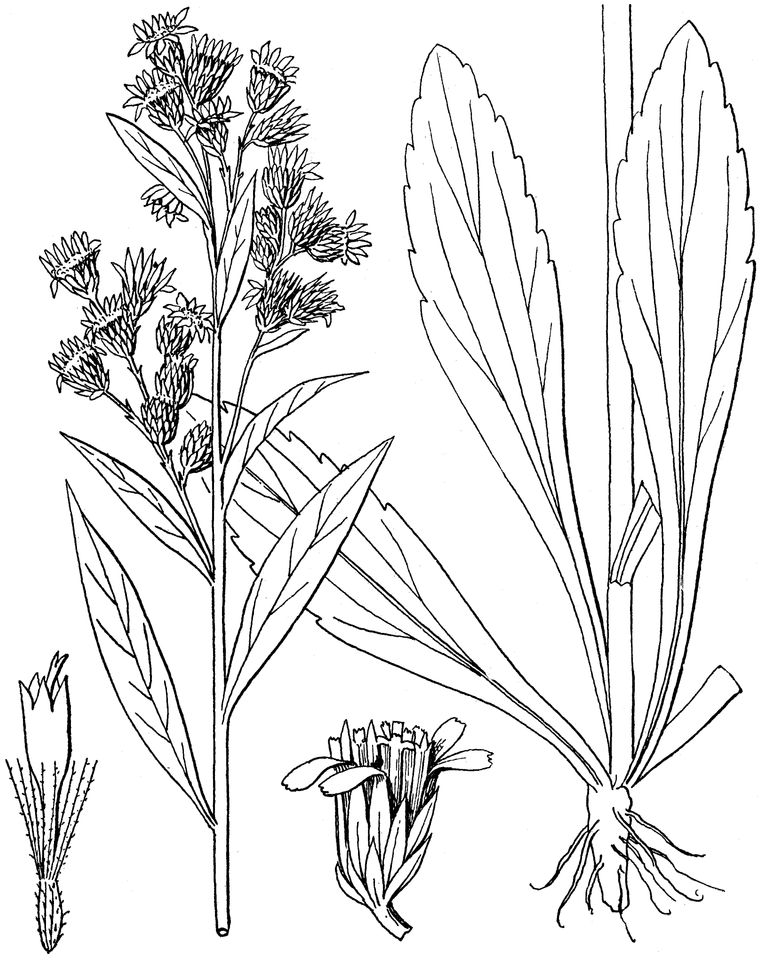
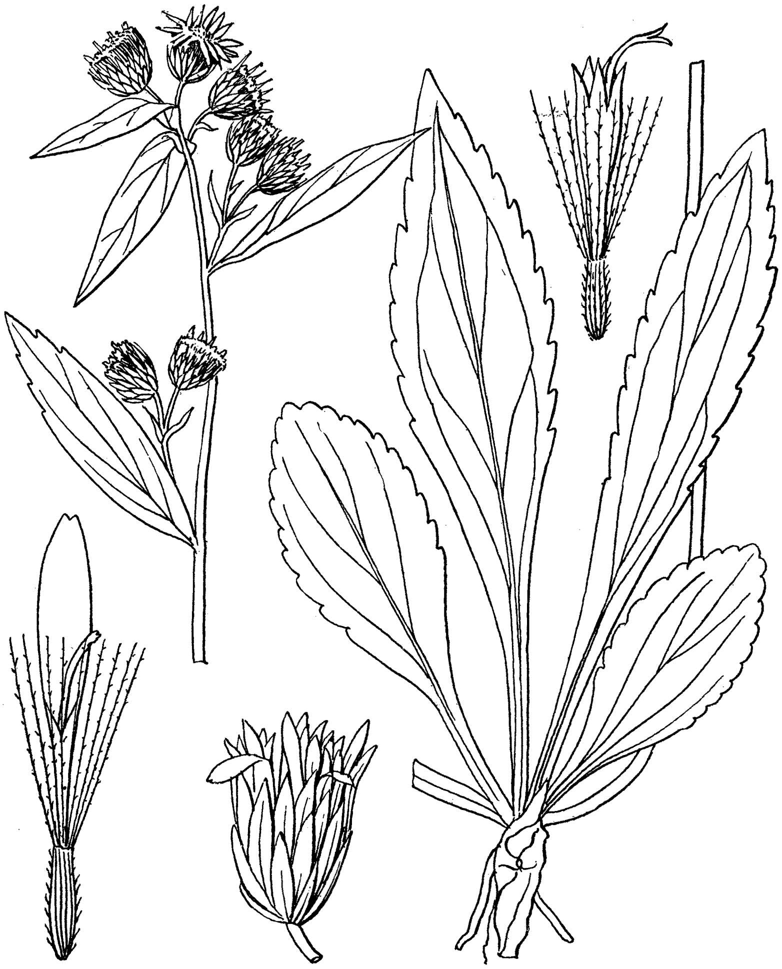


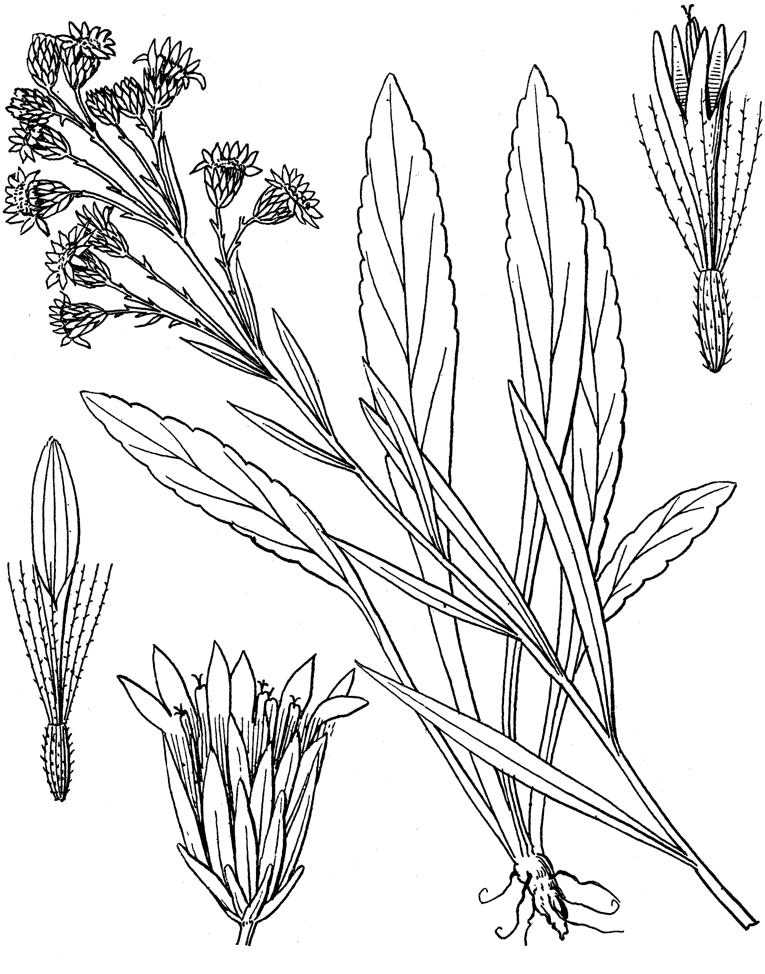
SOLIDAGO VIRGA-AUREA, L.

BULLETIN OF THE TORREY BOTANICAL CLUB.—PLATE CLIV.



SOLIDAGO ALPESTRIS, W. & K.

BULLETIN OF THE TORREY BOTANICAL CLUB.—PLATE CLV.



SOLIDAGO HUMILIS, PURSH.

159. AGROPYRUM REPENS (Linn.) Beauv.—Nat. from Eu. Frequent throughout.—Delaware (Smith's Cat.); Chester (Fl. Cestrica); Bucks (Moyer's Cat.); Philadelphia; Northampton; Lancaster.

AGROPYRUM VIOLACEUM (Hòrn.) Lange.—Rare and local.—Huntingdon, in the barrens near Birmingham, *Miss Davis;* Venango, *Garber.*

160. AGROPYRUM CANINUM (Linn.) Rœm. and Sch.).—Very rare and local.—Monroe, near Pocono Summit.

161. HORDEUM JUBATUM, Linn.—Fug. from Eu.—Berks, *Oberly;* Philadelphia, *Diffenbaugh.*

162. ELYMUS VIRGINICUS, Linn.—Frequent throughout.—Delaware (Smith's Cat.); Chester (Fl. Cestrica); Philadelphia (Barton's Fl.); Bucks (Moyer's Fl.); Northampton; Lancaster; Franklin; Blair, *Lowrie.*

163. ELYMUS CANADENSIS, Linn.—Common throughout. On river-banks.—Delaware (Smith's Cat.); Chester (Fl. Cestrica); Philadelphia (Barton's Fl.); Bucks (Moyer's Cat.); Northampton; Lancaster; Bedford, *Small.*

164. ELYMUS CANADENSIS, Linn., var. GLAUCIFOLIUS, A. Gray. Frequent on rocky banks and cliffs along rivers.—Northampton; Dauphin.

165. ELYMUS STRIATUS, Willd.—Frequent along the banks of streams.—Delaware (Smith's Cat.); Chester (Fl. Cestrica); Northampton; Franklin; Huntingdon.

166. HYSTRIX PATULA, Mœnch. (*Asprella Hystrix,* Willd.). Frequent throughout the State.—Delaware (Smith's Cat.); Chester (Fl. Cestrica); Bucks (Moyer's Cat.); Northampton; Lancaster; Franklin; Luzerne, *Heller;* Huntingdon, *Lowrie.*

Solidago humilis, Pursh, of the Eastern States, and its Allies.

(PLATES CLIII.-CLV.)

Solidago Virgaurea, L. has long been regarded as native in the higher latitudes of North America, and appears as such in the Flora of Torrey and Gray. In the 5th edition of his Manual, which covers less territory, Dr. Gray admits the species, but restricts it to two varieties, *alpina,* Bigelow, and *humilis* (Pursh).

In the Synoptical Flora Bigelow's variety alone is retained and Pursh's *humilis* restored to specific rank, but with its compass so enlarged as to embrace a number of diverse and ambiguous forms, amongst which are some that cannot be distinguished from European specimens of *S. Virgaurea* on the one hand, and are clearly separated, on the other, from *S. humilis* by their more robust habit, broader leaves and sharp-pointed involucral scales.

A recent study of these perplexing goldenrods in the herbaria of Columbia College, Lafayette College and the Philadelphia Academy of Natural Sciences, and especially in the large collections made during the last two or three years by Messrs. Rand and Redfield on Mount Desert Island, Maine, has led me to dispose of them as follows:

Solidago Virgaurea, L.—In his description of the type of the species De Candolle (Prod. v. 338) writes: "*mire varians, sed veris. in plures species non divellenda et imo varietatibus vix inter se satis diversis conflata*"—words that well express its behavior also on this side of the Atlantic.

Specimens collected at the Willey House, Notch of the White Mountains, N. H., by *Oakes*, *Pringle*, *Edwin Faxon* and others, and on Willoughby Mountain, Vt., by *Rusby*, tally with forms brought from the Isle of Wight and Sunningdale, England, by *Dr.* and *Mrs. Britton*, whilst others collected by *Dr. Morong* in the mountains of New Hampshire, and on Mt. Desert Island by Rand and Redfield, are very like the varieties *angustifolia*, Gaud. and *ericetorum*, DC. of the Old World, and in their foliage approach typical *S. humilis* of the New. (Plate CLIII.)

Besides those already recognized, I venture to characterize several more varieties, peculiar to our flora.

Solidago Virgaurea, L., var. RANDII, n. var. More or less glutinous; stems stout, erect, 1–2 ft. high, often dark purple, puberulent, or sometimes glabrate below; radical and lower leaves obovate or oblanceolate, acute, serrate, cauline lanceolate or elliptical-lanceolate, sparingly serrate or entire, glabrous; inflorescence an ample branched panicle or loose virgate thyrse; heads 3 lines or more long; outer scales of the involucre mostly ovate or lance-ovate and bluntish, sometimes almost linear and acute, inner ones oblong-linear, yellowish, with scarious margins and acute or acuminate tips; achenes pubescent or nearly smooth.—Named in honor of Mr. Edward L. Rand.

Rather common on the mountains of Northern New England and New York; abundant on Mt. Desert Island, Me., *Rand* and *Redfield;* shores of Lake Champlain, Vt., *Pringle.* Passes gradually into the next.

Solidago Virgaurea, L., var. *monticola.* (*S. puberula*, Nutt., var. *monticola*, Porter, BULLETIN xix. 129.)

Stems 3 to 12 inches high, often slender; inflorescence a short, compact or sometimes loose thryse, 2 to 4 inches long; heads 1½ to 3 lines long; scales of the involucre variable, ovate and bluntish or oblong and obtuse, inner ones not elongated.

Common on the highest points of Mt. Desert Island, *Rand* and *Redfield;* Mt. Kineo, Me., *Porter;* summit of Mt. Monadnock (el. 3169 ft.), *Deane;* Willoughby Mountain, Vt., *Rusby.*

Solidago Virgaurea, L., var. REDFIELDII, n. var.—Very glutinous. Stems stout snd rigid, 16–18 inches high; leaves thickish or coriaceous; branches of the panicle starting from half way down the stem or even from the base, strict, erect, bearing short clusters of heads in the upper bracts; heads small, 2–3 lines long; scales of the involucre short, more or less scarious. Its inflorescence is strikingly like that of *S. juncea*, Ait., var. *ramosa*, Porter and Britton.—Named in honor of *Mr. John H. Redfield.*

Western Mt. and Frenchman Camp Road, Mt. Desert Island, Me., *Rand and Redfield;* Summit Rock, Indian Pass, Adirondacks, N. Y. (el. 2600 ft.), *Dr. Britton.*

Solidago Virgaurea, L., var. GILMANII (A. Gray).

Solidago humilis, Pursh.—Stems slender, strict, minutely puberulent above, 4–18 inches high, the dwarf and taller ones growing together and often from the same roots, leafy; radical and lower leaves narrowly oblanceolate, and attenuated downward into slightly-margined petioles, serrulate above the middle, cauline ones lance-linear, entire, acute, glabrous; inflorescence glutinous, in the dwarf forms a short raceme, in the taller ones a loose or compact, virgate thyrse 5–8 inches long; heads 3–4½ lines high; scales of the involucre oblong-linear, obtuse, or the inner ones acutish, sometimes golden-yellow; achenes pubescent. (Plate CLV.)

On the rocky shores of rivers. Onion River, Vermont, *Rob-*

bins, *Oakes;* McCall's Ferry, on the Susquehanna, York Co., Pa., *Porter;* Great Falls of the Potomac, *Vasey.*

This is the type of the species according to Dr. Gray, and it agrees with the description in Pursh's Flora. In Northern New England and New York, and further northward and westward, in the Rocky Mountains and beyond, occur forms with broader leaves, smaller heads of flowers and shorter and more obtuse involucral scales, which have been placed under *S. humilis.* But they vary much, and their relations to the type must be left to future investigation.

The variety *microcaphala*, Porter (BULLETIN xix. 129), which was founded on a single specimen, proves to be on closer inspection a remarkable form of *S. nemoralis*, Ait.

Solidago alpestris, Wald. and Kit. (*S. Virgaurea*, L., var. *alpestris* (Koch), L. and var. *alpina*, Bigelow).—Alpine; stem glabrous or somewhat pubescent, 3–10 inches high, in the larger forms often bent, angular; radical leaves obovate, appressed-serrate above the middle, obtuse or acute, cauline oblanceolate or spatulate, of equal size, or 2 or 3 of the uppermost larger, longer and spreading, narrowed toward the base, obtuse or acute, sparingly serrate, distant; inflorescence a short raceme or thyrse with clusters of a few heads in the axils of the long upper leaves; heads 3–4 lines high; scales of the involucre acute; rays variable in length and breadth; achenes pubescent. (Plate CLIV.)

Summits of Mt. Katahdin, Me., the White Mountains, N. H., and Mt. Marcy (5300 ft.) and Mt. McIntyre (5100 ft.), N. Y.

At the highest elevations dwarfing obscures some of its characters, but the abundance of fine specimens obtained last summer by Dr. Britton in the Adirondacks exhibits the species in its fullest development, and on comparing them with *S. alpestris* from the Swiss and Carpathian Alps of Europe and the Altai Mountains of Asia the differences are so slight that the two must be regarded as identical. And such a conclusion ought to cause no surprise, when we consider the notable company of Old World alpines which occupy the same mountain-tops. This only adds one more to the number. From the polymorphous *S. Virgaurea* of Linnæus, spread over Europe at lower altitudes, the divergence is so wide that it may well be counted a good species. Koch himself was inclined to think so, as appears from his remark in the Flora Germanica (p. 341): "*Varietates hic enumeratæ plures, ut mihi videtur, species constituunt, sed hucusque nondum satis observatæ sunt.*"

Dr. Gray was inclined to connect our plant with the other European alpine variety, *Cambrica*, but that has oblong-lanceolate leaves which are pilose on both sides. THOS. C. PORTER.

Francis Wolle.

After a painful and protracted illness, Rev. Francis Wolle died at his home in Bethlehem, Pa., February 10th.

He was born at Jacobsburg, Northampton Co., Pa., December 17, 1817. His ancestors, for two generations, were conspicuously associated with the Moravian Society, and during his long and useful life he was always prominent in Moravian church and educational affairs. Although a few of his earlier years were spent in business, he soon turned his attention to teaching as his life-work, and in 1857 he became vice principal of the celebrated Moravian Seminary for Young Ladies at Bethlehem, Pa. In 1861 he became principal of the institution, and conducted its affairs with marked ability until 1881, when the increasing infirmities of age necessitated his seeking rest.

From his childhood the study of natural history was his favorite pursuit, and after his retirement from active professional work, in 1881, he devoted himself to it with more ardor than ever. He was especially known among botanists as an authority upon fresh-water algæ and desmids. In 1884 he published his "Desmids of the United States and list of Pediastrums." The volume contained 1100 illustrations on 53 colored plates. This was followed in 1887 by two volumes on "The Fresh-Water Algæ of the United States, complemental to Desmids of the United States." This work was illustrated by 117 colored plates, embracing 2300 figures. In 1891 he brought out a work upon the "Diatomaceæ of the United States." This contained 2300 figures on 120 plates. All of the illustrations enumerated were photo-lithographs from India ink sketches made by the author. During 1892 there appeared a revised and enlarged edition of the "Desmids of the United States."

His contributions to cryptogamic botany are recognized by